CLAIMS

We claim:

1. A temperature sensor comprising a thermometric ring oscillator capable of vibrating at a frequency indicative of a temperature at a predetermined location and transmitting a signal comprising said frequency wirelessly to a receiver, wherein the signal is modulated to increase the spectrum of information that can be transmitted to the receiver.

2. The temperature sensor of claim 1, wherein the signal is modulated by changing the vibrating frequency of the ring oscillator.

3. The temperature sensor of claim 2, wherein the ring oscillator comprises a plurality of inverter stages and at least a first switch, and wherein in response to a first signal the switch activates a first odd number of stages, which is less than all of the stages, such that the vibrating frequency of the ring oscillator with the first odd number of stages is different than the vibrating frequency of the ring oscillator with all of the stages.

4. The temperature sensor of claim 3, wherein in response to an all signal, the switch activates all of the stages.

5. The temperature sensor of claim 3, wherein the first and all signal comprise a binary signal.

6. The temperature sensor of claim 3, wherein the ring oscillator further comprises a second switch, and wherein in response to a second signal the switches activate a second odd number of stages, which is less than all of the stages, such that the vibrating frequency of the ring oscillator with the second odd number of stages is different than the vibrating frequency of ring oscillator with all of the stages.

7. The temperature sensor of claim 6, wherein the vibrating frequency of the ring oscillator with the second odd number of stages is different than the vibrating frequency of ring oscillator with the first odd number of stages.

8. The temperature sensor of claim 6, wherein in response to an all signal, the switch activates all of the stages.

9. The temperature sensor of claim 6, wherein the first, second and all signals comprise a ternary signal.

10. The temperature sensor of claim 2, wherein the ring oscillator comprises a plurality of inverter stages and a switch, and wherein in response to an on signal the switch activates all the stages and wherein in response to an off signal, the switch deactivates the ring oscillator, such that the switch is an on-off switch.

11. The temperature sensor of claim 1, wherein the sensor is calibrated prior to deployment.

12. The temperature sensor of claim 11, wherein the sensor resides in a constant temperature bath prior to deployment.

13. The temperature sensor of claim 12, wherein the bath can be set at a predetermined temperature.

14. The temperature sensor of claim 12, wherein the bath can be set at a plurality of predetermined temperatures.

15. The temperature sensor of claim 12, wherein the sensor is sheathed in a cell.

16. The temperature sensor of claim 15, wherein an antenna is attached to the cell.

17. The temperature sensor of claim 12, wherein the sensor transmits a signal indicative of a measured temperature.

18. The temperature sensor of claim 1, wherein the signal is modulated by shifting the phase of the vibrating frequency.

19. The temperature sensor of claim 18, wherein the ring oscillator comprises a plurality of delay elements and at least one inverter stage.

20. The temperature sensor of claim 19, wherein the delay elements relate to the temperature of said predetermined location.

21. The temperature sensor of claim 19, wherein the ring oscillator further comprises a multiplexor and wherein each delay element is individually connected to the multiplexor, so that at least one delay element is selected by the multiplexor.

22. The temperature sensor of claim 21, wherein the ring oscillator further comprises a first pseudorandom number generator operatively connected to the multiplexor, so that a pseudorandom pattern is superimposed onto the signal transmitted from the sensor to the receiver.

23. The temperature sensor of claim 22, wherein the receiver comprises a second pseudorandom number generator and an oscillator.

24. The temperature sensor of claim 23, wherein the receiver further comprises a plurality of shift registers.

25. The temperature sensor of claim 23, wherein the second pseudorandom number generator is synchronized to the first pseudorandom number generator, and the oscillator's frequency is adjusted to match the frequency of the transmitted signal.

26. The temperature sensor of claim 21, wherein the receiver comprises a phase locked loop.

27. The temperature sensor of claim 21, wherein the receiver comprises a modified phase locked loop.

28. A method for signal processing comprising the steps of:

(i) providing a controller connected to an energy detector and a frequency measuring device operatively connected to the energy detector;

(ii) detecting a measurable baud in the energy detector by comparing a received broadcasted signal to a predetermined threshold level indicating that the measurable baud is present;

(iii) waiting and observing the output of the energy detector at the conclusion of a period for all sequences that were non-active before the arrival of the measurable baud;

(iv) confirming the arrival of one of the baud sequences;

(v) predicting a time when each sequence will have non-overlapped baud;

(vi) confirming the arrival of the non-overlapped baud;

(vii) measuring the frequency at the predicted time; and

(viii) converting the frequency to temperature.

29. The method of claim 28 further comprising the step of providing a plurality of simultaneously broadcasting signals, wherein the signals comprise unique baud sequences, such that the baud sequences exhibit pair wise overlaps;